

Remarks/Arguments

The Office Action of August 23, 2005 and the references cited therein have been carefully studied and reviewed, and in view of the foregoing Amendment and following representations, reconsideration is respectfully requested.

The indication by the Examiner of the allowance of claims 6, 23, 25, 28 and 32, and of the allowability of the subject matter of claims 8 – 12, 14 – 16, 27, 29 – 31, 33 and 34 is hereby kindly acknowledged.

Claims 5, 7 – 16, 27, 29 – 31, 33 and 34 have been canceled. New claims 35 – 48, drawn to the elected invention, have been added. New claim 35 contains substantial limitations found in dependent claims 27, 29 – 31, 33 and 34 and is thus seen to be allowable for the same reasons that the Examiner did not reject any of these claims.

More specifically, new claim 35 sets forth a trench forming process wherein a first etching process using a photoresist pattern as an etch mask is performed to form an initial trench in an insulation film, the photoresist pattern is removed, and a second etching process is subsequently performed so as to widen the trench without substantially altering the depth of the trench. Refer to par. [0125] of Applicant's original specification, for example.

Okada et al. (USP 6,534,397) discloses a dual damascene method wherein a trench 23 is formed in an insulation film using a photoresist pattern 21 as an etch mask (FIG. 2H to 2I as described at col. 11, lines 38 - 44). Note, FIG. 2F in Okada et

al. does not illustrate a trench forming step; rather this figure clearly illustrates a step of forming a through-hole 20 in the insulation film.

Kazuhiko teaches a method of forming a through-hole in a substrate. In particular, Kazuhiko teaches a method wherein the photoresist pattern (etch mask) 4 is maintained during both the first etch process of forming an initial hole 7 in the substrate (FIG. 3b) and the subsequent etch process (FIG. 3c) of enlarging the initial hole 7, as was different from the allowable subject matter of claims 27, 29 and 30 and now recited in Applicant's invention of claim 35. Also, both the width and the depth of the initial trench are enlarged in the method taught by Kazuhiko again, unlike the allowable subject matter of claims 31, 33 and 34 and now recited in claim 35.

The reference to Iwasaki et al. (U.S. Patent Publication No. 2002/0167013) was relied on by the Examiner for the teachings therein associated with the use of an immersion bath in an etching process. However, the teachings of Iwasaki et al. do not overcome the deficiencies in the Kazuhiko reference described above. In particular, the process of Iwasaki et al. is somewhat like that taught by Kazuhiko, and unlike Applicant's invention of claim 35, in that the depth of the starting points 55 is increased (by the immersion step illustrate in FIGS. 10B – 10C, for example) to form through-holes (nano-holes) in the alumina layer 102 (FIG. 4A).

For these reasons, namely the differences between Applicant's invention as is now claimed and the references, including the lack of suggestion in the references of a two-step process of forming a trench in an insulation layer wherein an initial etching process is performed with an etching mask to form an initial trench, and a second etching process is carried out after the etching mask is removed so as to widen the initial trench without substantially altering the width thereof, it is seen that the references do not render Applicant's new claims 35 – 48 obvious under 35 USC 103. Accordingly, early reconsideration and allowance of the claims are respectfully requested.

Respectfully submitted,

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